

gridlocks – can you unlock the grid?

Functional groups

Before you answer the puzzles below fill in the table of functional groups using:

ester	ketone	R-O-R	R-OH	nitrile	acid anhydride
Functional group	Name	Functional group	Name	Functional group	Name
R-CN		R-NH ₂	amine		
$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^-$	carboxylate ion	$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{R}$			
$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}$		$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$	amide		
$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	aldehyde	$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$	carboxylic acid		
$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}$		R-X	haloalkane		
	alcohol		ether		

Gridlock 1

Each row, column and 2 x 2 box contains the functional groups ester, carboxylate ion, acid anhydride and aldehyde. Use your problem solving skills and the answers in the table above to fill in the blank boxes.

functional group		name	
$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{R}$			aldehyde
	$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	ester	
	acid anhydride		
		$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^-$	
name			functional group

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Gridlock 2

Each row, column and 2 x 2 box contains an amide, amine, ketone and nitrile.

functional group		name	
$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{NH}_2 \end{array}$			
		nitrile	
		$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{R} \end{array}$	
	amine		
name		functional group	

Gridlock 3

Each row, column and 2 x 2 box contains an alcohol, carboxylic acid, haloalkane and ether.

functional group		name	
	R-OH		ether
			alcohol
carboxylic acid			R-X
name		functional group	